# GTM500 Series

## 500 Amp 1500 Vdc Contactor

The GTM500—a world-class, fully bidirectional contactor engineered for today's most demanding applications. Leveraging a proven sealing technology rooted in aerospace heritage from the 10s, the GTM500 delivers exceptional reliability and long-term performance under extreme conditions.

The GTM series combines the best aspects of traditional ceramic and epoxy to metal sealing technologies. The GTM500 design excels in performance with respect to breaking performance, temperature (stress) resistance, integral robustness and short circuit withstand.

The GTM500 design provides reliable switching and circuit protection for high voltage applications up to 1500V and 500A, making it an ideal choice for energy storage systems (ESS), high power DC fast charging, heavy vehicles and other high voltage applications.

### Highlights

#### Safety

- Hermetic seal - no exposed arcing to open air environments
- UL and CE recognitions pending

#### Usability

- High efficiency DC Coils (PWM and dual coil). Ideal for systems that require low coil power consumption
- Upright and side-mounting housing with custom harnesses if required
- AUX switch SPST (normally open, normally closed)

#### Performance

- Best in class break performance for improved safety
- Advanced arc suppression for increased reliability and longevity
- Strong short circuit performance with no rupture or fire risk

### Features

- High power - up to 1500V / 500A
- Fully bidirectional switching
- Unique GTMS (glass-to-metal seal) technology

### Applications

# GMT500 Series Technical Specifications

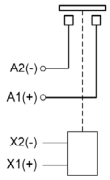
**Mounting**
M6 Bolts

**Case Material**
DuPont Zytel FR50
(25% Glass Filled Nylon)

**Power Connection**
Stainless M8x1.25 Stud or M6 x 1.0 tapped hole
Stainless M8x1.25 Flanged Nut
Torque 10Nm [90in-lb] max

**Coil Wire**
Silicone, 20 AWG, UL: VW-1

**Power Contacts**




**Auxiliary Contacts**
(optional)

| | | Units | Data |
|---|---|---|---|
| Contact Arrangement | Main | Form X | SPST-NO |
| | Auxilary (2A, 24VDC)[9] | Form A or B | SPST |
| Mechanical Life | | Cycles | 300,000 |
| Contact Resistance[1] | Max | mohms | 0.3 |
| Operate Time[2] | Max | ms | 40 |
| Release Time, Max | | ms | 12 |
| Insulation Resistance[3] | | Mohms | 100 |
| Dielectric At Sea Level | | VRMS | 5375 |
| Shock, 1/2 Sine, 11ms | | G | 20 |
| Vibration, Sinusoidal (500-2000 Hz Peak) | | G | 10 |
| Ambient Temp Range | Operating[4] | ˚C | -40 to +85 |
| | Storage | ˚C | -70 to +125 |
| Weight, Typical | | Kg (Lb) | <0.98 (2.2) |

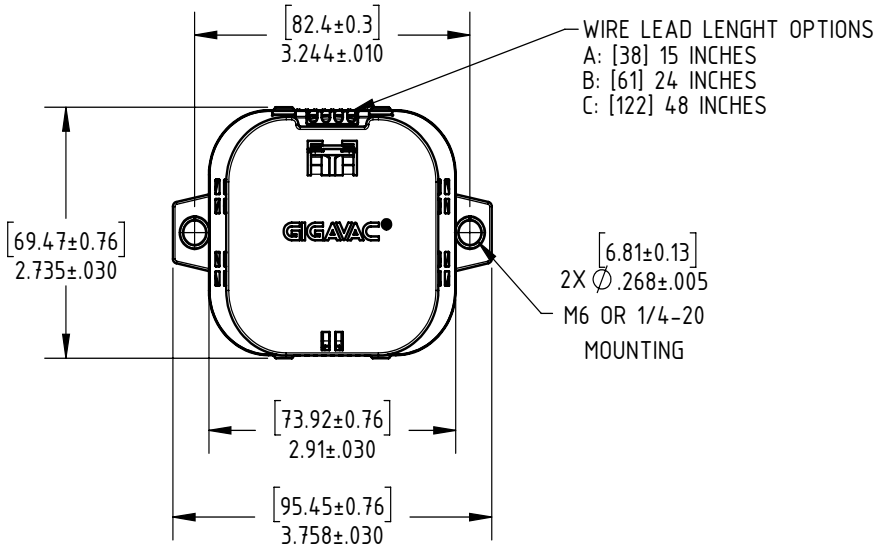
## Electrical Specifications

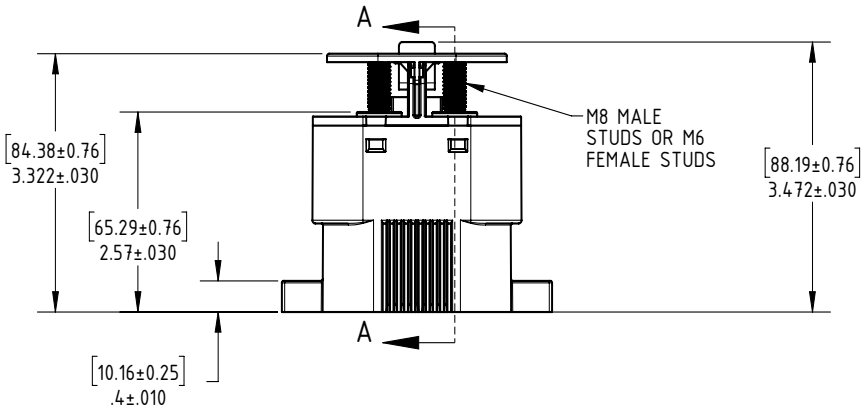
| | |
|---|---|
| Electrical Life (Resistive) with | 1500V, 1200A 1 break cycle |
| Current Withstand | 500A, Continuous |
| Short circuit withstand current | 8kA 5ms and passed at 10kA<br>1ms no smoke or fire. |

## Coil Ratings at 25˚C

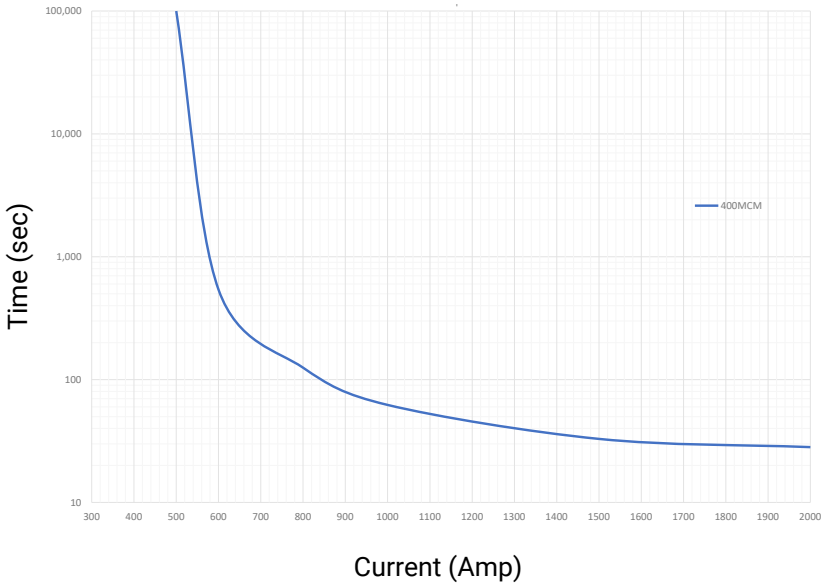
| Coil P/N Designation | B | C |
|---|---|---|
| Coil Voltage, Nominal | 12 VDC | 24 VDC |
| Coil Voltage, Max | 16 V | 32 V |
| Pick-Up Voltage, Max[5, 7] | 8 V | 16 V |
| Drop-Out Voltage | 0.5 to 4 V | 2 to 7.5 V |
| Pick-Up Current, Max (75 ms)[6, 7] | 4.3 A | 1.6 A |
| Coil Current[6] | 0.24 A | 0.09 A |
| Coil Power[6] | 2.9 W | 2.1 W |
| Internal Coil Suppression | | |
| Coil Back EMF | 55 V | 55 V |
| Transients, Max (13 ms) | ±50 V | ±50 V |
| Reverse Polarity | 16 V | 32 V |

# **GMT500 Series** Technical Specifications




**Current Carry vs Time**
with 85°C terminal temperature rise



# GMT500 Series Technical Specifications

| Ordering Options | Example: GTM501BAB |
|---|---|

**Family**
GTM500

**Mounting**
1: Bottom Mounting

**Coil Voltage**
**Red (positive) Black (negative)**
**B:** 12 Vdc, Internal Coil Suppression
**C:** 24 Vdc, Internal Coil Suppression

**Coil Termination**
**A:** Flying leads 30 cm (12 in)
**B:** Flying leads 61 cm (24 in)
**C:** Flying leads 122 cm (48 in)

**Auxiliary Contact**[8]
**(Blue and White)**
**X:** None
**B:** SPST, Normally Open
**C:** SPST, Normally Closed

## General Notes

1. Contact resisitance measured at currents higher than 100A at 30 seconds.
2. Operation time is measured at 25°C and includes maximum 7ms bounce.
3. Insulation resistance is 50 Mohms after life.
4. Contactor can operate up to 125°C in special cases terminal temperature needs to be confirmed in application (<150 C) - contact Sensata for details.
5. Contactor has two coils. Both are used for pick-up, and then in approximately 75 milliseconds, one coil is electronically removed from the coil drive circuit. The remaining coil supplies low continuous hold power sufficient for the contactor to meet all of its specified performance specifications. This provides low coil power without PWM electronics that can cause EMI emissions and/or cross-talk on control power.
6. Contactor is operated by a coil that changes resistance with temperature. Since pick-up current, coil current and coil power are specified at nominal voltage, they will be lower than indicated at temperatures above 25°C and higher than indicated at temperatures below 25°C. Similarly, pick-up and drop-out voltages will be higher than indicated at temperatures above 25°C and lower than indicated at temperatures below 25°C.
7. For pick-up testing of contactors with dual coils, the voltage can not be ramped up slowly, but must be applied instantly to at least the maximum pick-up voltage. Otherwise, the contactor will not pick-up.
8. Limit make current to avoid contact welding. Contact Sensata regarding DC Power Switching Cycle Life for part numbers that include auxiliary contacts.
9. Auxillary contact rating is 2A, 24Vdc Resistive load, 100,000 cycles. Minimum current is 10mA, 5V. The auxiliary contact is mechanically linked to the main power contacts.

- Contactors feature internal transorb for coil suppression. No external diodes should be added across the coil. The use of additional external coil suppression can slow the release time and invalidate the life cycle ratings, or can cause the contactor not to be able to interrupt the maximum current specified. If lower coil back EMF is required, please contact Sensata for assistance.
- Applications with capacitors will require a pre-charge circuit.
- Electrical life rating is based on resistive load with 27µH maximum inductance in circuit. Because your application may be different, we suggest you test the contactor in your circuit to verify life is as required.
- End of life is defined as when the dielectric, insulation resistance or contact resistance fails the specifications listed.
- Contact Sensata regarding DC Power Switching Cycle Life for part numbers that include auxiliary contacts.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Rev.07/17/2025